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On the Orbit of Struve 228. By J. E. Gore.

Recent measures show that this binary star has described about 120° of its apparent orbit since its discovery by Struve in 1829. I have computed the orbit by Professor Glasenapp's method, combined with Kowalsky's equations, and find the following provisional elements:—

Elements of Σ 228.

$P = 88·73$ years $☊ = 84° 49'$
$T = 1906·03$ $\lambda = 51° 36'$
$e = 0·5311$ $a = 0''·98$
$i = 70° 59'$ $\mu = +4°·057$

P and T were computed by the formulæ:—

$$T = \frac{t' + t}{2} - \frac{M' + M}{M' - M} \cdot \frac{t' - t}{2}$$

$$P = \frac{360°}{\mu}; \quad \mu = \frac{M' - M}{t' - t}$$

where M and M′ are the mean anomalies, computed from the geometrical elements, for the epochs t and t' and the corresponding values of θ, derived from the earlier and later observations.

The following is a comparison between the recorded measures and the positions computed from the above elements. The observed position-angles have been corrected for the effect of precession to 1880·0:—

Epoch.	Observer.	θ_o	θ_c	$\theta_o - \theta_c$	ρ_o	ρ_c	$\rho_o - \rho_c$
		°	°	°	″	″	″
1829·16	Struve	264·21	258·47	+ 5·74	1·08	0·83	+0·25
1831·75	„	262·41	262·50	− 0·09	1·22	0·96	+0·26
1832·02	„	259·00	262·80	− 3·80	1·14	0·99	+0·15
1832·20	„	263·50	263·00	+ 0·50	0·93	1·05	−0·12
1832·21	„	262·60	263·01	− 0·41	1·03	1·05	−0·02
1841·94	O. Struve	274·88	271·36	+ 3·52	1·32	1·20	+0·12
1852·19	Mädler	280·32	278·80	+ 1·52	1·11	1·18	−0·07
1856·76	Dembowski	281·12	282·48	− 1·36	1·0	1·12	−0·12
1857·21	Mädler	284·23	282·87	+ 1·36	0·9	1·11	−0·21
1862·96	Dembowski	286·57	288·57	− 2·00	0·9	0·98	−0·08
1866·07	„	291·66	292·45	− 0·79	0·947	0·89	+0·057
1869·48	Dunér	299·54	297·64	+ 1·90	0·71	0·78	−0·07
1870·18	O. Struve	299·64	298·93	+ 0·71	0·86	0·76	+0·10
1873·81	Dembowski	304·40	306·80	− 2·40	0·64	0·65	−0·01
1874·94	Gledhill	307·22	309·83	− 2·61	0·6	0·61	−0·01

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Epoch.	Observer.	θ_o	θ_c	$\theta_o-\theta_c$	ρ_o	ρ_c	$\rho_o-\rho_c$
		°	°	°	″	″	″
1875·20	Dunér	311·42	310·58	+ 0·84	0·52	0·60	− 0·08
1876·89	Dembowski	314·92	315·85	− 0·93	0·522	0·55	− 0·028
1878·90	Doberck	327·71	323·92	+ 3·79	0·47	0·49	− 0·02
1883·50	Engelmann	348·29	349·41	− 1·12	0·311	0·40	− 0·089
1888·142	Schiaparelli	33·60	22·33	+ 11·27	0·35	0·39	− 0·04
1888·171	Tarrant	17·23	22·54	− 5·31	0·43	0·39	+ 0·04
1888·696	,,	21·31	26·10	− 4·79	0·40	0·40	0·00
1888·778	,,	21·54	26·61	− 5·07	0·46	0·40	+ 0·06
1888·931	Schiaparelli	25·73	27·63	− 1·90	0·36	0·40	− 0·04
1889·018	,,	30·25	28·23	+ 2·02	0·35	0·40	− 0·05
1889·021	Young	34·56	28·24	+ 6·32	0·41	0·40	+ 0·01
1889·570	Tarrant	26·97	31·76	− 4·79	0·37	0·41	− 0·04

The recent measures by Professors Schiaparelli and Young and Mr. Tarrant were kindly communicated to me by private letter.

According to the above orbit the distance between the components will gradually increase during the next few years, up to a maximum of about 0″·55, and then diminish again as the companion approaches the periastron. The minimum distance will not be reached till the position-angle is nearly 180° (after the periastron passage), when the components will probably be separated by less than 0″·2. Careful measures during the next sixteen years will be very valuable for correction of the provisional elements.

On the supposition that the combined mass of the components is equal to the mass of the Sun, the "hypothetical" parallax would be

$$\pi = \alpha P^{-\frac{2}{3}} = 0''\cdot 05$$

The binary lies a little preceding 62 *Andromedæ*, and its position for 1890·0 is approximately:—

R.A. $2^h\ 6^m\ 59^s$, Decl. $+46°\ 58'\cdot 4$

The magnitudes of the components are about 6·7 and 7·6.

A Method of Recording the Transits of Stars by Photography.

By W. E. Wilson.

I wish to bring before the notice of the Society a method by which the transits of stars can be recorded by photography and the personal errors eliminated. If a sensitive photographic plate is placed in the focus of a transit instrument close behind the wires, and the image of a star of suitable magnitude allowed to transit across it, the result is a straight black line on developing the

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